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Southern Pine BEETLE NEWS



No. 16, December 1979

Radiograph Passes Test As Counter of Larvae

Radiographs, used successfully to study various insects such as sawflies and western pine beetle, have been tested to count the number and stage of development of southern pine beetle larvae in infested bark.

This method is much less time-consuming than dissecting bark to count and measure head widths of beetle larvae. It also provides a permanent record of the bark's contents.

A guide was devised in the Mizell-Nebeker study and tested on experienced and inexperienced people. The study revealed that good quality radiographs and some experience are needed to adequately identify beetle larval stages, particularly the first two instars. Results will be useful in population dynamics studies of bark beetles. MIZELL, R. F., III, and T. E. NEBEKER.

1979. Differentiating the life stages of the southern pine beetle from radiographs. *J. Ga. Entomol. Soc.* 14(3):229-238.

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Where Do We Stand With Program-Sponsored Publications?

The preparation of Program-sponsored publications is in high gear! This is where they stand: *How To Handbooks*—

1. "Southern pine beetles can kill your ornamental pine." Thatcher-Coster-Payne. USDA Home and Garden Bull. No. 226. 55,000 copies released. Additional 50,000 copies printed.
2. "A mill operator's guide to profit on beetle-

killed southern pine." Sinclair. USDA Agric. Handbk. No. 555. 6,000 copies printed.

3. "A field guide for ground checking southern pine beetle spots." Billings-Pase. Being printed, due out December 1979. 18,500 copies ordered.
4. "An aerial observer's guide for recognizing and reporting southern pine beetle spots." Billings-Doggett. Being printed, due out December 1979. 15,000 copies ordered.

In addition, four other "How To's" have been submitted to Washington or are in final stages. They deal with woodpeckers as predators of SPB (Kroll-Conner-Fleet), the economic impacts of SPB (Leuschner-Burkhart), identifying common insect associates of the SPB (Goyer-Lenhard-Nebeker-Jarrard), and use of the LORAN-C radio navigation system in aerial surveys (Dull). At least four other How To's are in various stages of preparation:

Hodges Gardens Symposium Proceedings—

The proceedings of the symposium "Evaluating control tactics for southern pine beetle," held at Hodges Gardens, Louisiana, January 30-February 1, 1979, (Technical Bulletin No. 1613) are at the printers. This publication represents a good synthesis of Program results relating to sampling, prediction, and evaluation of treatment tactics.

Technical Bulletins—

Initial editing of authors' drafts for the technical bulletin on site/stand/host conditions is complete. The edited draft of the entire bulletin has been reviewed by all authors and is now undergoing final review.

First drafts of most of the sections for a second technical bulletin on toxicant work have been received at "Beetle Central." The entire bulletin will be assembled, edited, and readied for review shortly.

Compendium—

Detailed chapter outlines from authors have been OK'd and first drafts of early chapters are

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arriving weekly. First drafts of chapters on natural enemies and associated organisms; site, stand and climatic factors; impacts of outbreaks; and direct control are being reviewed and edited in Program headquarters. Other chapters—biology and behavior, population dynamics, and cultural practices—will arrive soon. First drafts for over half of the chapters are now in hand.

Fact Sheets—

A series of numbered southern pine beetle fact sheets on Program results have been prepared by investigators. They are being “translated” and released by Forest Insect and Disease Management, Southeastern Area, S&PF in Atlanta. Called a Technology Update, these fact sheets highlight findings ready for dissemination to potential users. The message is captured on one page. To date the following Updates have been released:

- No. 1. Use of beetle-killed timber for lumber.
- No. 2. Use of beetle-killed timber for pulp, plywood and panelling.
- No. 3. Setting control priorities for the southern pine beetle.
- No. 5. Insecticides for the southern pine beetle.

Strengths, Grading Losses Change in Beetle-Hit Trees

How salvageable are beetle-killed southern pine trees from the perspectives of physical strength and of lumber marketing potentials?

A recent strength loss study concentrated on changes in bending and parallel-to-grain compression limits of beetle-hit trees. Tests showed that the percent reduction for compression strength was “substantially less” than that for the bending properties.

Incipient decay and associated sap stain may cause significant reductions in a tree's rupture and elasticity ratings as early as 2 months after foliage fade. However, these effects are not limiting defects under current grading rules.

A second study showed that lumber grade was significantly reduced 12 months after foliage fade was noticed on attacked trees.

Major causes of degrade were decay and large borer holes. The lumber recovery factor (LRF) was also lowered by increased slabbing by the sawyer and greater amounts of cull boards.

It was concluded that under Virginia conditions, dimension lumber could not be profitably cut from upper logs taken from beetle-killed trees left

standing two summers and one winter season after foliage fade.

SINCLAIR, S. A., T. E. McLAIN, and G. IFJU.

1979. Strength loss in small clear specimens of beetle-killed southern pine. *For. Prod. J.* 29(6):35-39.

SINCLAIR, S. A., and G. IFJU.

1979. Lumber quality of beetle-killed southern pine in Virginia. *For. Prod. J.* 29(4):18-22.

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Oleoresins Can Help Trees Survive Beetle Attacks

Certain physical properties of oleoresins can help southern pines survive beetle attacks. These characteristics make longleaf and slash pines less susceptible to beetle attack than loblolly and shortleaf pines.

The variables most important to a tree's survival were the oleoresin's total flow, rate of flow, and rate of crystallization. These characteristics also account for why loblolly and shortleaf pines survive attacks.

The authors feel that their results may make it possible to predict the relative susceptibility of individual loblolly and shortleaf trees on the basis of physical characteristics of their oleoresin.

The authors suggest that a tree improvement program could be undertaken to increase host resistance to beetle attack. But, the authors caution that the effectiveness of such a program has yet to be demonstrated.

HODGES, J. D., W. W. ELAM, W. F. WATSON, and T. E. NEBEKER.

1979. Oleoresin characteristics and susceptibility of four southern pines to southern pine beetle (Coleoptera:Scolytidae) attacks. *Can. Entomol.* 111:889-896.

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Beetle Claims 48,000 Homes

The Southern Pine Beetle Program of USDA is an intensified attack on the insect that in one year

alone—1973—caused loss of enough sawtimber to build 48,000 homes.

ESA Honors Gagne

The Entomological Society of America selected James A. Gagne, a Texas A&M doctoral candidate and ESPBRAP researcher, as its Outstanding Graduate Student for 1978, Southwestern Branch. Announced at ESA's meeting in Houston, the award was given in recognition of Gagne's academic accomplishments, publications, and potential contribution to entomology.

Gagne is researching the effects of constant temperatures on development, reemergence, and longevity of the southern pine beetle. His findings will provide the rate functions for the TAMBEETLE population dynamics models in Texas and for the Stephen-Taha model in Arkansas.

Inquiries Invited

Communications concerning the Southern Pine Beetle News, other Program reports, and your comments are encouraged and may be sent to Dr. R. C. Thatcher, Program Manager, in care of the address on the front page of this newsletter.

Brood Survival Compared for Severe and Mild Winters

Declining SPB populations were studied during the winters of 1975-76 and 1976-77. The first winter was mild, the second severe. A comparison was made of beetle survival, both in individual trees and in spots.

Survival in trees ranged from 12 to 59 percent for the mild winter. This was about the same as survival for the previous summer and fall. In spite of the high rate of brood survival, all spots died out the following season. Why? Probably because periodic emergence and dispersal greatly reduced the number of beetles available at a given time for spot growth.

The second winter had 99 days with temperatures below 0° C and 9 days when the high temperature did not get above freezing. The death rate for overwintering beetles was nearly 100 percent, and there was no spot growth the following spring.

Beetle survival for the mild winter was greatest

(86 percent) at the tree base, and least (3 percent) at the top of the tree. For the severe winter, the only SPB survivors—and their numbers were much reduced—were at the base of the bole.

McCLELLAND, W. T., and F. P. HAIN.

1979. Survival of declining *Dendroctonus frontalis* populations during a severe and non-severe winter. Environ. Entomol. 8(2):231-235.

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Symposium on Hazard Rating Systems in Forest Insect Pest Management

ESPBRAP researchers will be interested in a National Symposium on Hazard Rating Systems in Forest Insect Pest Management that will be held at Athens, Georgia, July 31-August 2, 1980. The event is sponsored by the Society of American Foresters, the U.S.D.A. Forest Service, and the University of Georgia.

The theme will be the development and use of stand susceptibility rating systems for insect pests of North American forests. The aims of the symposium are: (1) to identify hazard and risk rating methods in use in North America and land manager experience with them; (2) to investigate methods for developing, validating, and implementing rating systems; and (3) to identify where additional needs exist to improve the utility of rating systems. Presentations of contributed papers will be limited to 20 minutes with 10-minute discussions. Proceedings will be published.

Abstracts for contributed papers will be accepted for review until February 1, 1980. Submit 200-word reviewer's abstract and title to:

Dr. Roy L. Hedden, Program Chairman
College of Forest and Recreation Resources
Department of Forestry
Clemson University
Clemson, SC 29631

People on the Move

Tom Wiseman has left the Southern Station to become assistant editor for the Forest Farmers Association in Atlanta. He handled the editor/writer needs for ESPBRAP for our How-To

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handbook series, prepared our newsletters, wrote occasional feature articles and prepared press releases. He was a well-received, enthusiastic and tireless worker in the Program and will be sorely missed.

Bob Uhler, a computer programmer, has been hired by FIDM, Southeastern Area-S&PF, Atlanta. His initial assignment will be to work with Program Management and principal investigators to get selected descriptive and predictive SPB models into the Forest Service computer. Procedures will then be developed for maintaining and updating the models as new data or improved approaches become available. User guides will also be prepared to permit access to and use of the new technology in research, evaluations and control.

Other Publications of Interest

Buhyoff, G. J., W. A. Leuschner, and J. D. Wellman.
1979. Southern pine beetle infestation affects esthetic values of forest landscapes. *South. J. Appl. For.* 3(2):48-49.

Bunt, W. D.

1979. Southern pine beetle behavior on the bark of host trees during mass attack. M.S. Thesis. Stephen F. Austin State Univ., Nacogdoches.

Geer, S. F.

1979. Effects of weather on flight of the southern pine beetle, *Dendroctonus frontalis* Zimm.

(Coleoptera:Scolytidae). M.S. Thesis. Stephen F. Austin State Univ., Nacogdoches. 89 p.

Joye, L. G., and V. G. Perry.

1976. Incidence of *Contortylenchus* spp. in southern pine beetle populations from the southeastern United States. *J. Nematol.* 8:291.

Lashomb, J. H., and T. E. Nebeker.

1979. Investigations of egg niches, eggs and rate of oviposition for *Dendroctonus frontalis* (Coleoptera:Scolytidae). *Canad. Entomol.* 111:435-438.

MacGuidwin, A.

1979. Biology of *Contortylenchus brevicomi* (Nematoda:Sphaerulariidae) and its effect on gallery construction and fecundity of *Dendroctonus frontalis* (Coleoptera:Scolytidae). M.S. Thesis. Univ. Fla., Gainesville. 59 p.

Maine, J. D.

1979. A qualitative analysis of the southern pine beetle's (*Dendroctonus frontalis* Zimm.) impact on wildlife, wildfire and grazing. M.S. Thesis, Va. Polytech. Inst. & State Univ., Blacksburg. 132 p.

Maine, J. D., and W. A. Leuschner.

1978. The economic impact of the southern pine beetle on wildlife habitat and populations. *Va. J. Sci.* 29:42. (Abstr.)

Moore, K. R.

1979. Distribution of three species of *Ips* bark beetles within southern pine beetle infestations. M.S. Thesis. Stephen F. Austin State Univ., Nacogdoches. 37 p.

All publications are partially or wholly supported by the Southern Pine Beetle Program.